Sam Houston State University
Department of Agricultural Sciences

Turf and Cropland Irrigation and Drainage
AGRI 4390
Spring 2018 Syllabus

Part 1: Course Information

Instructor Information

Instructor: Dr. P. Ryan Saucier, Office: AETC 106 & Pirkle 440C
Lecture Time(s): Tuesday & Thursday, 11- 11:50 a.m., ATEC 100
Lab Time: Tuesday 3 - 4:50 p.m., ATEC 100
Virtual Office Forum: Available 24/7 for posting/viewing questions
Office Hours: Monday: 9-10 a.m. HATEC 106; Wednesday: 9 - 10 a.m. HATEC 106; 1-5 p.m. Pirkle 440C; others times must be arranged
Email: ryansaucier@shsu.edu
Office Telephone: 936-294-4883 **Cell:** 936-581-3457

Course Description

Design and selection of surface or sub-surface irrigation and drainage systems for golf courses, greenhouses, sports fields, crops, landscape applications, and construction sites. Principles of pressurized irrigation systems including crop water requirements, soil moisture, irrigation scheduling, sprinkler irrigation, trickle irrigation, pumps, pipelines, and irrigation wells will be covered. Writing enhanced. Prerequisite: AGRI 2303 or ITEC 1390. Credit 3.

Textbook & Course Materials

Required Text

- Irrigation (2011). (6th ed.). Irrigation Association, Falls Church, VA., ISBN #978-1-935324-50-8
- Course Packet from Eagle Graphics

Recommended Texts & Other Readings

- Other resources posted on Blackboard or handed out in lecture or lab

Course Structure

This course will be delivered in person through lecture and laboratory. Some portions of the course may be delivered through the course management system Blackboard™. You will use your SHSU account to login to the course from the Blackboard login page (http://shsu.blackboard.edu).

In Blackboard, you may access online lessons, course materials, and resources. At designated times throughout the semester, we will participate in a blend of self-paced and group-paced activities using Backboard and additional internet-based technologies. Activities may consist of chat, blogs, discussion forums, journaling, wikis, and web postings.

Technical Requirements

You must have access to a personal computer or a computer in which you have administrative rights so that you may install necessary plugins. See the Technical Requirements website for recommended system and browser requirements.

- Internet connection (DSL, LAN, or cable connection is desirable)
- An active SHSU Student Username and Password
- Webcam and headset (headphone/microphone combo) – Using headphones will eliminate the echoing effect of the microphone picking up audio from the computer speakers during live discussions.

Technical Assistance

The team at SHSU Online provides technical support for Blackboard through a variety of methods.

Website: Technical Support http://distance.shsu.edu/tech-support

Phone: 936-294-2780 – or – toll free 1-877-759-2232

Email: blackboard@shsu.edu or you can chat with a technician while inside your Blackboard course.

Below are some helpful resources if you wish to explore on your own.

- New students should start with the Online Student Orientation
  http://distance.shsu.edu/current-students/orientation.html
- A list of other helpful services can be found on the Student Resources page
  http://distance.shsu.edu/current-students/resources.html
- Blackboard Learn™ provides a variety of video tutorials at Student Videos
  https://help.blackboard.com/en-us/Learn/Reference/Blackboard_Learn_Videos/Student_Videos

Part 2: Course Objectives

1. Develop specific skills, competencies, and points of view needed by professionals in agricultural engineering technology
2. Gain factual knowledge (terminology, classifications, methods, trends) in agricultural engineering technology
3. Learn to apply course material (to improve thinking, problem solving, and decisions) from agricultural engineering technology

- Careers in irrigation
- Principles of irrigation
- Types of irrigation systems
- Principles of plumbing
- Principles of electricity
- Planning of irrigation systems
- Environmentally sound irrigation techniques

You will meet the objectives listed above through a combination of the following activities in this course:

Lecture/Laboratory	
Exams (2) x 100 points each =	200 points
Quizzes (4) x 25 points each =	100 points
Research Paper = (**Due April 5, 2018 at 11 a.m.)**	100 points
Student Research Presentation =	100 points
Labs/Field Trips/Guest Speakers (8) x 25 points =	200 points
Chapter Reading Comprehension Questions (10) x 10 points =	100 points
Irrigation System Design Project =	100 points
Irrigation System Design Project Presentation =	50 points
Attendance at Student Research Presentations * =	50 points

**** Students must attend 100% of all Student Research Presentations. Absences will not be accepted without a note from a physician.***

Total Points = 1000 points

Final Grade Assignment

A = 891 - 1000 B = 791 - 890 C = 691 - 790 D = 591 - 690 F = 590 or less

Part 3: Topic Outline/Schedule

Important Note: Refer to the course calendar for specific meeting dates and times. Activity and assignment details will be explained in detail within each week's corresponding learning module.

Class Schedule, Lab Schedule, and Reading Assignments

Wk.	Date(s)	Lecture Topic	Assigned Reading	Laboratory Topic
1	1/17-19	Introduction Overview of Irrigation Systems	Chp 1 & 2	No Lab
2	1/22-1/26	Soil-Water Plant Relations Irrigation Planning, Site Evaluation, and Design **CRCQ 1 (1&2) Due on 1/25**	Chp 3 & 4	No Lab
3	1/29-2/2	Irrigation Water Requirements Irrigation Water Supply **Quiz # 1** **CRCQ 2 (3&4) Due on 2/1**	Chp 5 & 6	**Irrigation Planning Lab # 1**
4	2/5-2/9	Hydraulics of Irrigation Systems Irrigation Pumping Plants **CRCQ 3 (5&6) Due on 2/8**	Chp 7 & 8	**Irrigation Planning Lab # 2**
5	2/12-2/16	Distribution System Components Sprinkler Fundamentals Mircoirrigation System Fundamentals **CRCQ 4 (7&8) Due on 2/15**	Chp 9,10, & 11	**Irrigation Installation Lab # 1**
6	2/19-2/23	Electricity for Irrigation **CRCQ 5 (9,10,&11) Due on 2/22** **Quiz # 2**	Chp 12	**Irrigation Installation Lab # 2**
7	2/26-3/2	Irrigation Scheduling Performance Audits **Mid Term Exam**	Chp 13 & 14	**Electricity Lab**
8	3/5-3/9	Irrigation System Economics Conservation and Environmental Protection **CRCQ 6 (12, 13, &14) Due on 3/8**	Chp 15,16, &17	**Irrigation Audit & Scheduling Lab**
9	3/12-3/16	**SPRING BREAK**		

10	3/19-3/23	Drainage of Irrigated Land Surface Irrigation **CRCQ 7 (15,16, & 17) Due on 3/22**	Chp 18 & 19	**Greenhouse Tour**
11	3/26-3/30	Microirrigation Sprinkler Irrigation Greenhouse Irrigation Nursery Irrigation **CRCQ 8 (18&19) Due on 3/29**	Chp 20,21,22, & 24	**Nursery Tour**
12	4/2-4/6	Residential and Commercial Irrigation Systems Golf Course Irrigation **CRCQ 9 (20,21,22,&24) Due on 4/5** **Research Paper Due on 4/5**	Chp 23,25,& 26	**Campus/Residential Irrigation Tour**
13	4/9-4/13	Other Irrigation Applications Land Application of Liquid Waste and Wastewater Reuse Chemigation and PAM **CRCQ 10 (23,25,26,27,28,29) Due on 4/12** **Quiz # 3**	Chp 27,28,& 30	**Golf Course Tour**
14	4/16- 4/20	**Research Presentations**	---	**Irrigation Project Presentations**
15	4/23-4/27	**Research Presentations**	---	**Irrigation Project Presentations**
16	4/30-5/4	**Research Presentations** **Quiz # 4**	---	**Irrigation Project Presentations**
17	**Final Exam, May 10, 2018, 12 – 2 p.m., AET Center, Room 100**			

Part 4: Grading Policy

Graded Course Activities

Late Work Policy

Be sure to pay close attention to deadlines-there will be **no make-up assignments, quizzes, or other course materials accepted beyond the due date without instructor approval and advanced notification.**

Viewing Grades in Blackboard

Points you receive for graded activities will be posted to the Blackboard Grade Center. Your instructor will update the online grades each time a grading session has been complete—typically 7 days following the completion of an activity. **However, research papers may take longer to grade.** Click on the My Grades link in the left navigation pane to view your points.

Letter Grade Assignment

Include an explanation between the relationship of points earned and final letter grade. Example: Final grades assigned for this course will be based on the percentage of total points earned and are assigned as follows:

Letter Grade	Percentage	Performance Level
A	89.1-100%	Excellent Work
B	79.1-89.0%	Good Work
C	69.1-79.0%	Average Work
D	59.1-69.0%	Poor Work
F	00.0-59.0%	Failing Work

Service Learning Opportunities

This course involves service to the community with opportunities to participate in activities outside of lecture and lab for extra credit. For students to gain extra credit, students are **required to complete 10 hours of work towards these projects**. These events will be announced throughout the semester. **Of the 10 required hours, 6 must be completed at the SHSU AET Center**. The **remaining 4 may be completed with a preapproved activity** and location such as a LDE or CDE. Also, students may undertake a preapproved independent project that will enhance the SHSU AET Center or the local community. Students may earn up to 100 points through service learning.

Assignments

1. **Exams –** each exam can consist of: multiple choice, short answer, essay, mathematic applications, and hands-on technical questions. The student will have 90 minutes to complete each exam. Students are encouraged to e-mail the instructor sample questions for each exam. These sample questions are worth an additional 5 points on each exam and must be in **multiple choice format** (***4 answer choices, the correct answer must be indicated as well***). Sample questions must be emailed to Dr. Saucier **no later than 48 hours prior to the exam** for credit. Each exam is worth 100 points. There will be two exams, a mid-term and a final exam. The final exam is not comprehensive. Students may elect to not take the final exam, however, they will receive a 0 in the grade book for the final exam.

2. **Quizzes –** each quiz can consists of: multiple choice, short answer, essay, mathematic applications, and hands-on technical questions. The student will have 20 minutes to complete each quiz, worth 25 points each. A total of 4 quizzes worth a total of 100 points. These may be delivered in an online format.

3. **Research Paper -** each student will write a research paper about emerging agricultural systems technology. This paper will be **due April 5, 2018 at the start of lecture.** This paper is worth 100 points. Papers will be graded during the week of final exams. **Each student will provide an electronic copy (MS Word format, email to Dr. Saucier) and hard copy of their work**.

4. **Student Research Presentation –** each student will present a **20 minute** presentation concerning their research paper topic. **This presentation will be in Microsoft PP format, and will be emailed to Dr. Saucier, 2 days prior to the presentation date.** Students will also develop 10 short answer or multiple choice questions as well. This presentation is worth 100 points.

5. **Laboratories, Field Trips, Guest Speakers** – each student will attend and participate in each laboratory, field trip, guest speaker. An activity worksheet or summary report will be required from each student. A total of 10 laboratories, field trips, guest speakers, worth 20 points each, for a total of 200 points.

6. **Chapter Reading Comprehension Questions** – ***each student will write (10) reading comprehension questions (10 multiple choice questions, with 4 answer choices, ABCD) over the assigned chapter readings***. Please include the correct answer (bolded) and indicate where the correct answer was found. Ex: Title of Handout, pg. number, paragraph number or Title of Power Point Slide, Line number. **Each student will be required to email a MS Word copy of the questions by the due date and hand in a hard copy in class**. The format shall be: 10 Chapter Reading Comprehension Questions x 10 points each = 100 points

7. **Irrigation System Design Project** - each student will design an irrigation project, using a folding tri-board, for an assigned area and complete the project per the rubric. Each student will complete their own work. (100 points) Due

8. **Irrigation System Design Project Presentation** – each student will develop a Power Point presentation/ or display a folding tri-board over their Irrigation System Design Project and present the presentation to the class. 10 minutes per presentation. (50 points) Due

9. **Attendance at Student Presentations** – each student shall be present at **ALL** student research presentations. Failure to do so will result in a zero. If the student attends all student research presentations, the student will receive 50 points. **Failure to attend all presentations, will result in a zero.**

10. **Graduate Student Assignment # 1** – all graduate students must complete a hands on, laboratory project that reinforces concepts taught during lecture. This project will be of Dr. Saucier's choice and design. AGET will provide all materials and incur all costs. The graduate student will provide all labor, design, and development of the project. Ex: Mock irrigation system for educational purposes. This will be a pass/fail grade.

11. **Graduate Student Assignment # 2** – all graduate students will design, develop, and present (2) 90-minute Power Point presentations over technology topics in irrigation. These topics will be of Dr. Saucier's choice. This will be a pass/fail grade.

Emerging Technology Paper Grading Rubric

Name:	Possible Points	Points Earned
Grading Criteria		
Content of the Project (4-5 pages plus cover page and references)		
• Did the author explain the process/research/technology?	20	
• Did the author explain the impact of the process/research/technology?	20	
• Did the author discuss the future of the process/research/technology and any challenges associated with the process/research/technology?	20	
Additional Materials Provided for the Project		
• Variety (Handout, pictures, etc.)	10	
• Accuracy of information (Was the information up to date and not dated?; No older than 5 years)	10	
Quality of Writing		
• Grammar, Punctuation, Spelling	5	
• Organization (APA, 6th ed.)	5	
• References	10	
Total Points	100	

Paper Format

- 12 point font, Times New Roman, 1" margins all sides, single spaced, APA 6th edition formatting
- Students may use up to a ½ page of pictures in the paper to explain the process/research/technology or place them as an appendices at the end of the paper
- Students must use in citations in the text and list these citations on a reference page in alphabetical order per APA style
- No abstract is needed for this paper
- 5 additional points added for peer review and edits
- 5 additional points if paper is reviewed by the SHSU Writing Center

Example of an APA Style Reference Page

References

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*.

Englewood Cliffs, N.J.: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*, New York, NY: W.H. Freeman.

Borich, G. D. (1980). A needs assessment model for conducting follow-up studies. *The Journal of Teacher Education, 31*(3), 39-42. doi: 10.1177/002248718003100310

Burris, S., Robinson, J. S., & Terry, Jr., R. (2005). Preparation of preservice teachers in agricultural mechanics. *Journal of Agricultural Education, 46*(3), 23–34. doi:10.5032/jae.2005.03023

Center for Agricultural and Environmental Research and Training, Inc. (n.d.) *New Mexico curriculum center*. Retrieved from: http://www.caert.net/estore1/statecurriculum/New%20Mexico/default.asp

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). Hoboken, NJ: John Wiley and Sons, Inc.

Example(s) of In-Text Citiations:

Summary of Concpets, Ideas, or Written Word:

These professionals include school-based agricultural educators who must possess the knowledge and skills needed to prepare a diverse workforce to address societal and industry challenges (Doerfert, 2011).

Harlin, Roberts, Dooley, and Murphrey (2007) found that the skills and knowledge required of these teachers far exceed those of secondary teachers who instruct other academic subject matter.

Direct Quote of Work:

This area of school-based instruction has been noted as an important component of “any high quality agricultural education program” (Phipps, Osborne, Dyer, & Ball, 2008, p. 303).

Part 5: Course Policies

Attendance

Regular and punctual class attendance is expected of each student at Sam Houston State University. This course will consist of both synchronous (scheduled) and asynchronous activities. Synchronous activities are outlined in the course schedule. Please make it a habit to visit the course home page periodically throughout the week to check for announcements. If applicable, timely entry into online meeting spaces will be expected during those scheduled times.

Participate

Students are expected to participate in all activities as listed on the course calendar. Failure to participate in lecture and laboratory activities often results in students earning poor grades in the course.

Code of Conduct

As a member of a community dedicated to learning, inquiry, and creation, the students, faculty, and administration of our university live by principles that require all members to be conscientious, respectful, and honest. Students should also understand that honest conduct reaches far beyond just academic honesty.

Completing Assignments

Assignments must be submitted by the given deadline or special permission must be requested in advanced from the instructor ***before the due date***. **NO LATE WORK IS ACCEPTED!**

Understand When You May Drop This Course

It is the student's responsibility to understand when he/she may need to consider unrolling from a course. Refer to the SHSU Course Schedule for dates and deadlines concerning registration.

Classroom Electronics Policy

Each student is expected to display professional behavior in the classroom and laboratory in terms of using electronic devices, i.e. cell phones, PDA, computers, iPad, tablets, etc. This means only using electronic devices in class or laboratory when needed to enhance educational purposes, i.e. no texting, using social media websites, etc. If you need to text or make a phone call, please step out of class to avoid disrupting your classmates. Violation of this policy could result in your expulsion from class/ laboratory if your activity interferes with learning.

Required Personal Protection Equipment (PPE) and Supplies

Students are required to have the following PPE and materials for the laboratory:

- OSHA Z87.1 Approved Safety Glasses
- Closed toe, shoes or boots (No sandals, no flip flops, etc.)
- Clothing appropriate for the outside weather (this may include pants, shoes, jackets, hats, gloves, etc.)
- Drafting supplies needed for Irrigation Design Project (pencils, colored pencils, paper, assorted drafting tools)

Required Policies at SHSU

The following are mandatory policies and procedures practiced by Sam Houston State University and can also be found at http://www.shsu.edu/syllabus/.

Academic Dishonesty

The University expects students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experience both in and out of the classroom. Accusations of academic dishonesty, proceedings, and subsequent disciplinary actions are addressed in The Texas State University System, Board of Regents policy on Academic Honesty, Chapter VI, Subsection 5.3, "Academic Honesty" and in the University's Academic Policy Statement 810213.

Student Absences on Religious Holy Days Policy

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examination, for the observance of a religious holy day, including travel for the purpose. Section 51.911(a)(2) defines a religious holy day as: "a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20…" A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University Policy 861001 provide the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe a religious holy day shall present to each instructor involved a written statement concerning the religious holy day. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. This policy is fully addressed in Academic Policy Statement 861001.

Students with Disabilities Policy

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance are expected to visit with the Services for Students with Disabilities office located in the Lee Drain North Annex and can be contacted by phone at 936-294-3412 (Voice), 936-294-3786 (TDD), or via email at disability@shsu.edu. They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Counseling Center and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Counseling Center. This policy is fully addressed in Academic Policy Statement 811006.

Visitors in the Classroom

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar Office.

AGET 4390
Research Paper Presentation Grading Rubric

Name:	Possible Points	Points Earned
Grading Criteria		
Content of the Presentation		
• Did the presenter give a historical background on the technology?	10	
• Did the presenter explain the technologies contribution to industry/society?	10	
• Did the presenter discuss the future of the technology and any challenges associated with the technology?	10	
• 100% Attendance at all student presentations	30	
Quality of the Presentation		
• Clarity	2	
• Variety	2	
• Enthusiasm	3	
• Task- oriented, business- like behavior and dress	20	
• Opportunity for students to apply concepts learned for future endeavors	3	
• Appropriate use of time (15 – 20 minutes)	5	
Overall Effect of the presentation	5	
Total Points	100	

AGET 4390
Irrigation Design Project

Directions

Students will design an irrigation system for a predetermined area of land using irrigation technology that is correct for the mission at hand. Ex. Using landscaping irrigation technology to irrigate a yard. Students will identify the type of irrigation system that they would like to design, locate a field/home, take pictures, create a draft, and complete all the engineering calculations to correctly design an irrigation system.

Guidelines

Projects must include…

- Detailed colored pictures of the land/home where the irrigation system is designed for.
- Detailed measurements of the land/home where the irrigation system is designed for.
- A scaled, colored, and detailed overhead draft of the land/home and the irrigation system. A 18" tall by 24" long draft would be sufficient to provide enough detail.
- A bill of materials for all irrigation supplies.
- Math calculations for all aspects of the irrigation system (friction loss of all pipes, fittings, valves, etc., voltage drop in all electrical wires, etc.)
- Soil analysis of the site. What type of soil are you dealing with? Sample required.
- Brief description of the types of plants being irrigated and their water requirements for growth.
- * Assume a 100 psi entrance pressure at the water meter if your system uses a municipal water supply. If well water, then assume a 75 psi water pressure.

AGET 4390
Irrigation Design Project Grading Rubric

Criteria	Points Available	Points Earned
Pictures of land/ area	10	
Detailed measurements of land/ area	10	
Scaled, colored, overhead draft	20	
Bill of materials	10	
Math calculations - Friction loss - Velocity loss - Voltage Drop - PSI at emitters - Flow at emitters	30	
Soil type? (Sample required)	10	
Plants being irrigated and water needs	10	
	100	

AGET 4390
Irrigation Design Project Presentation Grading Rubric

Criteria	Points Available	Points Earned
Overview of project?	10	
Clarity of voice?	5	
Volume of voice?	5	
Answer technical questions accurately?	10	
Professional attitude/dress/behavior?	20	
	50	